**Integrated Water Resources Management Activity List**

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| IWRM ACTIVITY | BASIC APPROACH | COMPREHENSIVE APPROACH |
| 1. Establish regional & catchment goals | Short-term needs considering long-term factors | Long-term needs considering short-term impacts |
| 2. Comprehensive information base | Obtain existing information and experience | Combined available information with new data reflecting management needs |
| 3. Projecting future conditions | Predictions based on recent experience and goals | Develop alternative scenarios reflecting alternative goals and investments |
| 4. Governance | Accept existing but review concepts that assist in new goals | Analyze alternative concepts and opportunities for change |
| 5. Strategy development | Design activities consistent with multiple existing goals | Consider alternative strategies and their relative value in achieving multiple objectives |
| 6. Environmental integration | Considered sustainability of projects in the context of present and likely policies on sustainability | Develop integrated programs that optimally achieve multiple objectives to assure asset and environmental sustainability |
| 7. Operating practices | Assure coordination of present and proposed activities | Create new efficient operating practices to optimize public service |
| 8. Strengthen local capacity to implement IWRM | Optimize existing capacities to support IWRM goals | Carry out diagnosis of capacity gaps and prioritize actions to strengthen those capacities considered to be strategic for improving sustainability of IWRM. |

Source: Industry Sector Report for WSSD prepared by IWA

<http://www.gdrc.org/uem/water/iwrm/1pager-02.html>

**The 5C's of Water Management**

There are essentially five 'C's that need to be taken into account in developing water management policies:

* **Commitment.** The political will to achieve effective implementation is indispensable on the part of those taking part – both in public and private sector.
* **Content.** Policies must be meaningful – especially the poor and marginalized in developing countries.
* **Cooperation.** Water management need to be prepared with the full involvement of the stakeholders concerned.
* **Checking.** Monitoring of implementation and of results is essential – with all stakeholders involved.
* **Communication.** Successful communication includes reporting to the public on results, as well as listening to feedback.

<http://www.gdrc.org/uem/water/iwrm/1pager-11.html>

**Principal Components of IUWRM**

Integrated Urban Water ResourcesManagement (IUWRM) is a participatory planning and implementation process, based on sound science, which brings together stakeholders to determine how to meet society's long-term needs for water and coastal resources while maintaining essential ecologial services and economic benefits.

The principal components of an IURWM system include:

* **Supply optimization**, including assessments of surface and groundwater supplies, water balances, wastewater reuse, and environmental impacts of distribution and use options.
* **Demand management**, including cost-recovery policies, water use efficiency technologies, and decentralized water management authority.
* **Equitable access** to water resources through participatory and transparent management, including support for effective water users association, involvement of marginalized groups, and consideration of gender issues.
* **Improved policy, regulatory and institutional frameworks**, such as the implementation of the polluter-pays principle, water quality norms and standards, and market-based regulatory mechanisms.
* **Intersectoral approach** to decision-making, combining authority with responsibility for managing the water resource.

<http://www.gdrc.org/uem/water/iwrm/1pager-10.html>

**Water management must make a series of important transitions ….**

In meeting water resource challenges, a series of transitions are underway which have major implications for water management.

* **From development *or* management to development *and* management:** For decades water resource management was equated with the building of water infrastructure. Experience showed this to be a major error, for economic, social and environmental reasons. In reaction, some have shunned hydraulic infrastructure as being unnecessary and destructive. The emerging view is that both of these extremes are wrong and that, in most developing countries, both management improvements and priority infrastructure have an essential and complementary roles in contributing to sustainable growth and poverty reduction.
* **From Local to Regional and International Management.** Water management is moving from being just a local issue to a national issue, and from a national to an international one, requiring new approaches to financing, dispute prevention and resource management.
* **From Disputes to Cooperation.** Growing demand for water for cities, industries and the environment means that there is a growing need for consensual mechanisms (from the local to the international level) for dispute resolution, and for re-allocating water in response to changing demands and values. Water could become a cause of conflict; alternatively it could become a major catalyst for cooperation at all levels - and even economic integration. Experience has shown that benefit-generating hydraulic infrastructure has played an important role in regional integration and stability in Eastern Europe (the Baltic Sea), South East Asia (Thailand and Laos), South Asia (the Indus Basin) and Southern Africa (Lesotho Highlands).
* **From Public to Public-Private Partnership**. Much of the necessary infrastructure is multi-functional (e.g. reservoirs generating electricity and providing protection from floods). Financing of water resources infrastructure is not cleanly separable into public and private but increasingly requires public-private partnerships. While private investment and management must play an increasing role, this must take place within a publicly-established long-term development and legal and regulatory framework, and without crowding-out community-managed infrastructure and beneficiary participation in design and management of water systems.

<http://www.gdrc.org/uem/water/iwrm/1pager-05.html>

**Implications of IWRM on other Sectors**

**1. Water Supply and Sanitation:**

* Emphasis on ensuring that the poor are served;
* Commercial viability of utilities;
* Separation of provider and regulator;
* Increasing role of the private sector through a variety of methods, ranging from management contracts to full privatization;
* Working with independent small-scale water providers and scaling up their involvement;
* Developing approaches which distinguish between large cities and small towns;
* Building on the emerging PSD ideas on output-based aid;
* Emphasis on transparency of process and legal and institutional framework;
* Capacity building for regulators;
* Growing emphasis on sanitation and sewerage;

**2. Irrigation and Drainage**

* Emphasis on greater physical and economic productivity of water;
* Greater attention to basin-wide rather than farm-level efficiency;
* Addressing the perverse effects of subsidies for pumping groundwater;
* Linking irrigation reform with broader development strategies, with attention to the political economy of reform;
* Linking irrigation reform with broader water resource management approaches, with increasing attention to water allocation and water rights issues;
* Strengthening emphasis on greater productivity from existing investments, with attention to improved efficiency and conservation;
* Upscaling user involvement through water user associations and improved accountability systems, based on successful global best practice;
* Improving regulatory frameworks, financial viability, and improved performance through benchmarking, competition, and greater involvement of the private sector ;
* Increasing emphasis on salinity, waterlogging, drainage, and water quality management in irrigation.

**3. Energy**

* Reaching the poor with electricity services;
* Stimulating competition among energy suppliers;
* Commercial pricing and enterprise viability;
* Expanded private sector participation;
* Mitigate risks beyond the control of private investors and private risk insurers in energy supply;
* Developing and strengthening objective, transparent regulation;
* Spreading the lessons of reform from early reformers;
* Reducing the CO2 emission intensity.

**4. Environment**

* Promote better policy, regulatory, and institutional frameworks for sustainable environmental management;
* Work across sectors to enhance the environmental benefits of projects and programs that provide access to infrastructure;
* Greater attention to rights and market-based instruments;
* Attention to water resource management and climate change;
* Inclusion of environmental flows and ecosystem management in water management; Improve safeguard systems and practices;
* Promotion of Strategic Environmental Assessments to move "upstream" in the decision-making cycle;
* Promoting environmentally and socially sustainable private sector development;
* Focusing on the positive linkages between poverty reduction and environmental protection;
* Focus first on local environmental benefits, and build on overlaps with broader benefits;
* Link the level of our efforts to our clients' overall commitment.

Source: World Bank Water Strategy, 2001

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| [Return to the IUWRM main page](http://www.gdrc.org/uem/water/iwrm/index.html) |

<http://www.gdrc.org/uem/water/iwrm/1pager-06.html>

**IADB Operational Guidelines for IWRM Projects**

**a. Water Use**

* *Problem Identification and classification:*  
  What is the nature and type of problem the proposed project is intended to solve? Does it affect any important freshwater ecosystems? What are the main functions and sservices of these ecosystems?
* *Actors:*  
  Who are the actors (public sector, civil society, private entrepreneurs) and what is their role in decision making and execution of the project?
* *Environment:*  
  What are the principal characteristics of the water use environment that will shape the actions of the actors?

**b. Water Resources Management**

* *Rules and their effectiveness:*  
  What rules are now in place for utilizing water? For solving use and conservation conflicts? For allocation between users and generations? For water quality control? Water resources development, conservation and/or management? How effectively do they address the social, economic and environmental causes of water conflicts?
* *Approach:*  
  Is the approach project-based, subsectoral or integrated? Does it prioritize development or management, or includes both? Is it isolated, watershed or river basin oriented? Does it consider upstream and downstream uses and effects, including coastal areasif appropriate? Are there any groundwater resources and water quality issues and have they been considered?
* *Actors:*   
  Who are the actors involved in applying these rules and approaches and what role does each play?
* *Coordinating mechanisms and its effectiveness:*  
  What mechanism is in place to coordinate the implementation of rules, approaches, and decisions? How effective is it? What is its relationship to environmental entities at other levels? Does it adeuqately merge micro concerns at the operational level with macro concerns at the constitutional level (merging 'top-down' and 'bottom-up' approaches)?

**c. Water Policy Law**

* Are there, at the highest political level, adequate country-wide policy andlegal instruments that facilitate an integrated approach to managing water resources? Are there important constraints that prevent it? How could they be eased?

Source: Inter-American Development Bank, Strategy for Integrated Water Resources Management, 1998

<http://www.gdrc.org/uem/water/iwrm/1pager-07.html>

**Characteristics of an Urban Water Management System**

An urban water management system cannot be achieved by a single organization in isolation. It requires the coordinated efforts of the local, provincial and national government agencies as well as NGOs and community organizations.

A sustainable water system will encompass issues such as:

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| **Environment** | **Community** | **Economy** |
| * watershed protection * ecosystem balance * waste-water and biosolids | * sufficient and reliable water supply * participation in planning * recreational use to water | * Evolution and diversification * Sustainable and long-term growth |

Within this overall vision, an urban water management system will require, among other steps, the following action to be taken:

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| http://www.gdrc.org/uem/water/iwrm/drop.gif | **Form Strategic Partnerships** |

* + - national agencies
    - provincial agencies
    - local/city departments
    - non-governmental organizations

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| http://www.gdrc.org/uem/water/iwrm/drop.gif | **Develop alternative water sources** |

* + - reclaimed/treated water
    - desalination
    - rainwater
    - water reuse

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| http://www.gdrc.org/uem/water/iwrm/drop.gif | **Implement new technologies** |

* + - water fees/metering
    - leak detection
    - water auditing systems

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| http://www.gdrc.org/uem/water/iwrm/drop.gif | **Engage the community** |

* + - community education
    - local and regional planning processes
    - outreach to cultural and community groups

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| http://www.gdrc.org/uem/water/iwrm/drop.gif | **Conduct research** |

* + - aquifer monitoring
    - coastal marine environment study
    - supply-demand forecasting
    - pollution prevention

It is within this perspective that we need to ask eight questions to develop a compelling vision for sustainable water supply:

1. Do we know how our local water resources are created and sustained?
2. Do we understand howour community uses and impacts our water supply?
3. Have we conducted a thorough assessment of our existing water supply system?
4. Do we have a sustainable, long-range water plan?
5. Have we involved the community appropriately in decisions that affect their water?
6. Do we understand the technologies available to achieve a sustainable water supply?
7. Do we have the capacity to drive the changes required by our plans?
8. Do we have the expertise to operate and continuously improve our water system?

Source: Extracted from brochures of City and County of Honolulu

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| [Return to the IUWRM main page](http://www.gdrc.org/uem/water/iwrm/index.html) | [Return to the IUWRM main page](http://www.gdrc.org/uem/water/iwrm/index.html) |

<http://www.gdrc.org/uem/water/iwrm/1pager-09.html>

# How to Clean Up Our Water

## Twelve simple ways you can help stem the tide of polluted runoff.

Everyday household activities are a major contributor to polluted runoff, which is among the most serious sources of water contamination. When it rains, fertilizer from lawns, oil from driveways, paint and solvent residues from walls and decks and even waste from pet Fido are all washed into storm sewers or nearby lakes, rivers and streams -- the same lakes, rivers and streams we rely on for drinking, bathing, swimming and fishing. Here are some ways you can help reduce polluted runoff.

**In Your Home:**

**1. Correctly dispose of hazardous household products.** Keep paints, used oil, cleaning solvents, polishes, pool chemicals, insecticides, and other hazardous household chemicals out of drains, sinks, and toilets. Many of these products contain harmful substances -- such as sodium hypochlorite, petroleum distillates, phenol and cresol, ammonia and formaldehyde -- that can end up in nearby water bodies. Contact your local sanitation, public works, or environmental health department to find out about hazardous waste collection days and sites.[\*](http://www.nrdc.org/water/pollution/gsteps.asp#notes) If a local program isn't available, request one.

**2. Use nontoxic household products whenever possible.** Discarding toxic products correctly is important, but not buying them in the first place is better. Ask local stores to carry nontoxic products if they don't already. For examples of safe substitutes for toxic household products, check [EPA's EnviroSense](http://es.epa.gov/techinfo/facts/safe-fs.html) website.

**3. Recycle and dispose of all trash properly.** Never flush non-degradable products -- such as disposable diapers or plastic tampon applicators -- down the toilet. They can damage the sewage treatment process and end up littering beaches and waters.

**4. Conserve water.** Use the most efficient plumbing fixtures. A whopping 73 percent of the water you use in your home is either flushed down the toilet or washed down the shower drain. Toilet dams or bricks placed in your toilet tank can save four gallons of water per flush, or up to 13,000 gallons a year for the average family of four. Low-flow toilets and showerheads also yield major water savings. Repair drips promptly; a dripping faucet can waste 20 gallons a day, a leaking toilet 200 gallons. Sweep driveways and sidewalks instead of hosing them down.

**In Your Yard:**

**5. Use natural fertilizers.** Apply natural fertilizer such as compost, manure, bone meal or peat whenever possible. Ask your local hardware and garden supply stores to stock these natural fertilizers. You can also buy a composting setup at a garden supply or hardware store, or by mail. Composting decreases the need for fertilizer and helps soil retain moisture. If you don't know how to compost, visit [The Compost Resource Page](http://www.oldgrowth.org/compost/) or the EPA's [composting pages](http://www.epa.gov/epaoswer/non-hw/muncpl/compost.htm).

## Concerned about the environment?

**Sign up for our monthly newsletter and find out what you can do.**

Top of Form



Bottom of Form

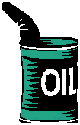
[See the latest issue](http://www.nrdc.org/newsletter/)

**6. Avoid over-watering lawns and gardens.** Use slow-watering techniques on lawns and gardens. Over-watering lawns can increase the leaching of fertilizers into groundwater. Trickle or "drip" irrigation systems and soaker hoses are 20 percent more efficient than sprinklers.

**7. Decrease impervious surfaces around your home.** Having fewer hard surfaces of concrete and asphalt will improve drainage around your home and in your yard. Do your landscaping with vegetation, gravel or other porous materials instead of cement; install wood decking instead of concrete, and interlocking bricks and paver stones for walkways. Redirect rain gutters and downspouts to soil, grass or gravel areas. Planting vegetation at lower elevations than nearby hard surfaces allows runoff to seep into soil.

**8. Maintain septic systems properly.** Have the septic tank cleaned out every three to five years. Effluent from failed or poorly maintained septic systems can contaminate groundwater. Monitoring and cleaning your system regularly also saves money by prolonging the life of the system.

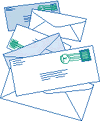
**Maintaining Your Car:**

**9. Recycle used motor oil.** Avoid pouring waste oil into gutters or down storm drains, and resist the temptation to dump wastes onto the ground. A single quart of motor oil that seeps into groundwater can pollute 250,000 gallons of drinking water. If you don't have a place to recycle used motor oil in your community, ask your local sanitation or public works department to create one.[\*](http://www.nrdc.org/water/pollution/gsteps.asp#notes) When you buy motor oil, ask if the store or service station has a program to buy back waste oil and dispose of it properly. Keep up with car maintenance to reduce leaking of oil, coolant, antifreeze and other hazardous fluids.

**10. Be "green" when washing your car.** Hand-wash your car on the lawn with a bucket of soapy water, rags and a hose. Just turning off the hose between rinsings can save up to 150 gallons. Or, if you don't want to do it yourself, choose a car wash that recycles its water.

**In Your Community:**

**11. Help identify, report and stop polluters.** Join a local clean water or environmental group that monitors industries and sewage treatment plants that are discharging wastes.[\*\*](http://www.nrdc.org/water/pollution/gsteps.asp#notes) Local groups can be effective working together with state environmental agencies, EPA and national groups like NRDC to ensure that industries comply with regulations.

**12. Be an activist.** Contact your public officials and attend hearings to encourage them to support laws and programs to protect our water. Ask officials to control polluted runoff, increase protection for wetlands and other aquatic ecosystems, reduce the flow of toxics into our waterways, and strengthen enforcement. Volunteer for a beach or stream clean up, tree planting, water quality sampling, or stream pollution monitoring project sponsored by a local environmental group or watershed council. Visit NRDC's [Earth Action Center](http://www.nrdc.org/action/default.asp) to get government contact information and learn about urgent issues you can get in involved in.

\* See the blue pages of your local phone book. It contains listings for local, county, state and federal government offices in your area.  
  
\*\* To find a local clean water organization in your area, contact the Clean Water Network at [cleanwaternt@igc.org](mailto:cleanwaternt@igc.org).

### Related NRDC Webpages:

#### [Advanced Ways to Clean Up Our Water](http://www.nrdc.org/water/pollution/grunoff.asp)

last revised 4/11/2001

<http://www.nrdc.org/water/pollution/gsteps.asp>

http://www.water-guide.org.uk/